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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/913,966	01/14/2002	Colin Ramshaw	A01203US	8338

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EXAMINER
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RAO, G NAGESH

ART UNIT	PAPER NUMBER
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1722

DATE MAILED: 09/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/913,966	<b>Applicant(s)</b> RAMSHAW ET AL.	
	<b>Examiner</b> G. Nagesh Rao	<b>Art Unit</b> 1722	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☒ Claim(s) 14, 16 and 17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

***Claim Objections***

1) The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Examiner is uncertain as to whether claims 14 and 16-17 are to be formally examined or not. In the current set of amended claims that are put forth for examination, claims 14 and 16-17 are missing from the set. Correction is requested as to whether those claims do exist and if not appropriate action for either renumbering or noting as to whether they were cancelled or need to be added for official examination purposes. The secondary set of claims submitted for showing clarification of amended changes includes claims 14 and 16-17, but as examiner stated in the official set those claims are missing.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2) Claims 1-4, 6, 7, 9, 12, 13, 15, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Christensen (WO 96/00189).

Christensen 189 relates to an apparatus and process whereby an invention is taught of a process for the conversion of a fluid phase substrate by heterogenous contact of the substrate or a fragment or derivative thereof with a solid phase agent wherein the solid phase agent is comprised as a surface of a support element or part thereof and the support element is adapted to rotate around an axis such that the solid phase agent, that comprises a growth agent to allow for mineralization to occur (i.e. a format of crystallizing), provides a rotating surface or part thereof and the substrate provides a film flowing radially outward from the axis in dynamic contact with the agent characterized in that additional vibrational energy is applied to the substrate.

Furthermore Christensen 189 teaches a process whereby a vibrational energy source is applied to the substrate when on and as being applied to the rotating surface, as well the rotating surface is mounted off-centre on the axis of rotation, the solid phase agent is titanium oxide but also may be an aero solgel material that also notes in alternative embodiments that the solid phase agent comprises a

reagent, catalyst, or dopant initiator to aid in the reaction and lastly the additional radiation/thermal energy may be of a UV Source (See Page 11 Line 3 to Page 14 Line 5, Page 19 Line 25 to Page 21 Line 7, Figures 3-4).

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
- 3) Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Christensen (WO 96/00189) in view of Urwin (EP 0499362A1).

From the aforementioned Christensen 189 refers to a process that relates to the decomposition of organic materials. However Christensen 189 failed to teach the use of a corrugated or mesh surface as in the particular texture as related to the solid phase agent.

In a related process of organic material decomposition, Urwin 362 teaches the use of a corrugated surface as related to the solid phase agent composition, in order to aid in better adhesion and mixing with the fluid-liquid agent reacted on top of the solid phase agent component (See Page 2 Lines 8-21).

It would have been obvious at the time of the invention to modify the teachings of Christensen 189 with that of Urwin 362 given the same state of technology to include the use of a corrugated surface in order for better adhesion and optimization of the process for breaking down the organic materials.

4) Claims 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christensen (WO 96/00189) in view of Jachuck and Ramshaw *Process Intensification: Heat Transfer Characteristics of Tailored Rotating Surfaces Heat Recovery Systems and CHP* Vol. 14 pp. 475-491, 1994.

From the aforementioned Christensen 189 teaches a process that includes using a sol-gel means of coating a substrate with the solid phase agent that is

utilized in reacting with the fluid phase agent. However Christensen 189 fails to teach an alternative method of deposition being that from a spray technique instead of a sol/gel technique.

In a method related to substrate coating and fluid phase reagent interactions with the substrate material for chemical reactions, Jachuck and Ramshaw teach the coating of these discs to one in particular for a spraying technique (See P. 478 Section 2.2.3, P. 481 Section 6.1).

It would have been obvious at the time of the invention to one having ordinary skill in the art to modify the teachings of Christensen 189 to include a spraying of the solid phase agent technique to occur in order for more uniformity of the material ontop of the substrate thus adhering better and allowing for a more uniform reaction between the liquid phase agent and the solid phase agent.


#### ***Allowable Subject Matter***

5) The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach the use of either an ultrasound emitter in producing a vibrational energy source to the rotational body. The teachings have some sort of vibrational input occur onto the system but none elude to the specific

teachings of an ultrasound emitter. Therefore claims 5 and 10 are indicated as allowable subject matter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to G. Nagesh Rao whose telephone number is (571) 272-2946. The examiner can normally be reached on 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yogendra Gupta can be reached on (571)272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

  
YOGENDRA N. GUPTA  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
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GNR